

**REMARKS**

Applicants have duly noted the double patenting rejection of claims 1, 6, 8-10, 16 and 18-20. In response thereto, they are fully prepared to file a partial or complete terminal disclaimer upon allowance of one or more of these claims.

The examiner has rejected all claims, except 7, 8, 17, 18, and 29-31, as being obvious and thus unpatentable over the teachings of Parady and Kruse et al. Furthermore, the Hennessy et al patent is used for a showing of different length latency events. The examiner has also rejected the same claims (with the exclusion of claim 33) as obvious and thus unpatentable over the teachings of the Joy patent in combination with Kruse et al, again using the teachings of Hennessy et al as extrinsic evidence of short and long latency events.

In response to the first rejection, Applicants have amended independent claims 1 and 11 to further distinguish the patentable features of the present invention over the Parady patent in view of Kruse et al. Accordingly, these two claims should be deemed to be allowable over the cited references. Likewise, the rejected claims that depend from these two claims, namely claims 3, 5-7, 9, 10, 13, 15-17, 19-23 and 32-33, should also be considered as being allowable.

The examiner had taken exception to the terms 'short latency event' and 'long latency event'. Applicants refer to page 4 of their specification wherein the duration of a 'short' event is one of 25 machine cycles or less, whereas a 'long' event is over 25 cycles. The precise dividing line between the two events should not be determinative of the patentability of the system and method taken as a whole, but is a secondary feature of patentability as specified in the dependent claims 3, 5, 13 and 15. Furthermore, Parady does not recognize the occurrence of the two different events (long latency vs. short latency) or the method of dealing with each

of them in a different manner. As stated by the examiner on page 5 of this office action, Parady has taught that the thread execution control includes control logic for temporarily transferring the control to the next thread when execution stalls due to a short latency event, and for returning control to an original thread when the latency event is completed. Then, three lines later, the patent reiterates "...control will eventually be transferred back to the first thread." Thus, Parady is talking about latency events wherein the control is returned to the first thread under all circumstances whereas in claims 1 and 11, applicants now clearly note that long latency events cause full control to be passed onto and retained by the next thread. These two claims also now specify that full control is retained by that next thread until that thread is stalled. However, the claims do not specify, nor is it essential, that the control be returned to the first thread upon stalling. Furthermore, claims 1 and 11 explicitly state that control is returned to the first thread only upon completion of a short latency event.

Although the examiner refers to a cache miss as a short latency event, it should be noted that Parady teaches a cache miss as a long latency event (see Abstract).

Applicants further point out that in Parady, the multiple threads are pieces of the same program rather than independent processes. As noted by the examiner in Paragraph 10 of the office action, execution of another thread is dependent upon the stalling of a first thread. Thus, it is clear that there is a dependency. This is sharply contrasted with claims 1 and 11 wherein applicants specifically refer to the multiple instruction execution threads as independent processes in a sequential time frame.

Applicants respectfully submit that independent claims 1 and 11 as now presented clearly distinguish over the combined teachings of the cited and applied Parady and Kruse et al references. For instance, in paragraph g) on page 7 of the office action, the examiner

suggests that it would have been obvious to "...modify Parady such that the threads have access to data available in a tree search structure". However, this does not necessarily suggest that the threads are overlapping. Applicants submit that overlapping the threads as claimed is not an obvious expedient notwithstanding the combined teachings of Parady and Kruse et al. Thus, the claims that depend from claim 1, namely claims 3, 5-10, 32 and 33, should also be considered as allowable. Likewise, with claim 11 containing allowable subject matter, claims 13 and 15-23, all depending from claim 11, should be considered allowable as well. These dependent claims have been amended so that each preamble corresponds to the language of the preamble of claim 11. Thus, the examiner's objection to the insufficient antecedent basis for the claim limitation is now overcome.

The rejection of dependent claims 8 and 18 as obvious over the combined teachings of Parady, Kruse et al and Flynn et al (hereinafter Flynn) is respectfully traversed. Claims 1 and 11, from which claims 8 and 18 depend, respectively, have been amended to overcome the teachings of the applied prior art. Both of the independent claims now specify that control is returned to the first thread when the stall is due to a short latency event, and that full control is retained by the next thread when the event is long. Respectfully, applicants submit that the independent claims do, in fact, distinguish over the prior art and are allowable. Accordingly, claims 8 and 18 should likewise be deemed to be allowable.

The rejection of claims 1, 3, 5-7, 9-11, 15-17, 19-23 and 32 as obvious and thus unpatentable over Joy in view Kruse et al under 35 U.S. C. 103(a) is respectfully traversed. Again, as stated previously in connection with the patentability of claims 1 and 11 over Parady, applicants have clarified the mechanism whereby full or partial control is transferred to a next thread based upon the length of a latency event. This limitation then serves to

clearly distinguish over Joy. The debate over short versus long event is irrelevant to the teachings of the present invention because Joy does not draw any distinction between the operation of his system for a short event or for a long event. Furthermore, it is important to note that Joy does not specify that providing multiple instruction execution threads represents independent processes as indicated by the examiner. Instead, as previously noted, these processes are interrelated. This is because they are pieces of the same program and thus are not independent.

One of the distinguishing features of claims 1 and 11 as now amended is that full control is passed to the subsequent thread in the case of a long event. Thus, applicants' invention does not contemplate the return of control to the first thread in situations in which the stall is a long event. Also, by amendment, applicants now specify that **full control is retained by the next thread after the long latency event has been completed**. Thus, the absence of this feature in the claims, as twice noted by the examiner on page 17 of the office action, is specifically overcome, further distinguishing the present invention as now claimed, over the combined teachings of Joy and Kruse et al.

In paragraphs 14 and 20 of the office action, the examiner makes a very interesting observation. He states that because the Parady patent makes no mention of switch overhead, then the patent teaches that switching requires no overhead. If the examiner persists in this argument, he is encouraged to provide support for his reasoning.

The weight of the evidence clearly points to features in claims 1 and 11 that patently distinguish the present invention over the teachings of the prior art. Accordingly, claims 1 and 11 should be allowed. All of the claims that depend from these two independent claims

provide further limitations on the scope of coverage and should likewise be reconsidered and allowed.

Turning now to the rejection of independent claim 27, the amendments to this claim serve to clearly distinguish the subject matter thereof over the teachings of the cited and applied prior art. As with claims 1 and 11, this claim has been amended to include the feature that the control by a thread with the highest priority is switched to the next thread upon occurrence of a long latency event and is retained by the next thread until the next thread is stalled. This distinction serves to clearly differentiate the present invention as worded in claim 27 from the applied prior art.

Applicants have introduced new claim 35, dependent upon claim 27, to more completely capture the entire subject matter of the present invention. With claim 27 containing patentable subject matter, applicants respectfully submit that claim 35 should be deemed to be allowable.

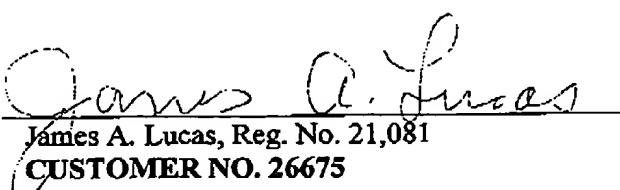
The other references cited by the examiner but not applied by the examiner have been reviewed and have been determined to be no more relevant than the applied references.

#### CONCLUSION

All of the claims as now worded are clearly patentable over the prior art previously cited and applied and should be allowed.

Respectfully submitted,

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